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ABSTRACT

This paper examines the claim that instruction specially adapted to the "visual learning styles" of Native American students results in improved learning. Substantial cross-cultural research suggests that Native American children have special strengths in spatial abilities and visual memory and that observational learning is an important cultural orientation. However, an extensive computerized literature search yielded only three studies that empirically tested the proposition that the instruction adapted to Native Americans' learning styles increases achievement, and it was found after a careful review which this paper reports that virtually none of the results substantially demonstrates the educational benefits of adapted instruction. Nonetheless, the concept of "Native American learning styles" continues to enjoy considerable popularity. It is speculated that the idea persists for the following reasons: (1) educators prefer to avoid "deficit" language; (2) the concept is useful for obtaining funding for culturally oriented programs; and (3) the concept is useful for summarizing a variety of instructional adaptations necessary in a cross-cultural context. The paper concludes that future research might demonstrate some educational benefits from visually-oriented instruction but the lack of progress in the broader area of aptitude-treatment interactions offers no basis for optimism. It is suggested that researchers interested in improving Native American education might better direct their investigations elsewhere. This document includes a 26-item bibliography. (TES)

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Adapting Instruction to Native Americans' "Learning Styles":

An Iconoclastic View

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Running head: ADAPTING INSTRUCTION TO LEARNING STYLES

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Abstract

This paper examines the claim that instruction adapted to the "visual learning styles" of Native American students results in greater learning. We argue that:

1. Substantial cross-cultural research suggests that Native American children have special strengths in such areas as spatial abilities and visual memory and that observational learning is an important cultural orientation, but that
2. Virtually no research has succeeded in demonstrating that instruction adapted to Native Americans' visual learning style results in greater learning.
3. Nonetheless, the concept of "Native American learning styles" continues to enjoy considerable popularity due to: (a) educators' desire to avoid "deficit" language, (b) the concept's use in obtaining culturally oriented program funding, and (c) the concept's use in summarizing a variety of instructional adaptations necessary in a cross-cultural context.

Adapting Instruction to Native Americans' "Learning Styles": An Iconoclastic View

This paper examines the claim that instruction adapted to the "observational learning styles" of Native American students will increase achievement. Many studies do suggest that certain groups of Native American children have special strength in such areas as spatial abilities and visual memory. In a review of the educational literature, however, we fail to find support for the common conclusion that adapting instruction to Native Americans' learning styles will increase achievement.

Several reviews of the literature on the ability patterns and "learning styles," variously defined, of Native American groups are already available (McShane & Plas, 1984; Osborne, 1985; Kaulback, 1984; More, 1984; Kleinfeld, 1973; Shade, 1984). We, therefore, only briefly summarize this research in the first section of this paper. We devote the major portion of the paper to a detailed examination of research empirically testing the hypothesis that instruction adapted to Native American learning styles will result in greater learning. Finally, we discuss the reasons for the popularity of the learning style concept despite the paucity of findings showing that instruction adapted to Native American learning styles actually has educational benefits.

Research on Cognitive Ability Patterns and Learning Styles

Psychological Research

The term "learning style" in research on Native American education is commonly used to refer to an ill-defined assortment of abilities and modes of processing information: spatial abilities, right-brain hemispheric dominance, visual memory, field-independence, holistic or successive rather than sequential patterns of information processing, preference for visual sensory modality, and so forth. As More (1984, p. 4) points out, "There is a confusing array of definitions of learning style. Indeed few studies ever define the term precisely....The semantic problem is exacerbated by confusion with related terms such as cognitive style, teaching style, and learning abilities."

In studies of Inuit groups, Berry (1966, 1971) elegantly develops the theoretical basis for the assertion that particular Native American groups may have elevated visual and spatial abilities. The ecological demands of a particular environment along with a group's cultural adaptations to that environment may press for the development of a particular pattern of cognitive abilities. In several studies, Berry (1966, 1969) found that Canadian Inuit indeed scored considerably higher on various spatial and visual tests than either the Temne of Sierra Leone (an African agricultural society

with strict socialization practices) or Scots (a Western comparison group).

Kleinfeld (1971) has also found that Yup'ik and Inuit village students exceeded urban students of the same ages on a modified version of the Memory for Designs Test. Bland (1975), using the same test, reported similar results in a comparative study of Navajo, Hopi, Jicarilla, and Caucasian school children. MacKinnon (1972), however, did not replicate this finding in a small study of Canadian Inuit students.

Comparative studies of cognitive abilities between Caucasian and particular Native American groups are plagued by numerous sampling and measurement problems that make the comparisons inexact (MacArthur, 1973; Kleinfeld, 1973). Due to these kinds of problems, it is difficult to draw conclusions as to whether spatial and visualization abilities are indeed higher among Native American groups than among Caucasian groups. Various studies of the performance of Native American groups on such tasks as the Block Design and Object Assembly sub-tests of the Wechsler Adult Intelligence Scale or the Goodenough Draw-A-Man Test have reached inconsistent findings (McShane & Berry, forthcoming; Kleinfeld, 1973). Some studies report higher scores among Native American groups while others report scores about the same or slightly lower.

What is clear is that visual-spatial abilities are an area of relative cognitive strength. Native Americans typically show a pattern on cognitive tests characterized by relatively high scores on performance measures and substantially lower scores on verbal measures (McShane & Plas, 1984; Kaulback, 1984; Connelly, 1983; Zarske & Moore, 1982; McShane & Plas, 1982; Diessner & Walker, 1986).

In sum, psychological research on the performance of Native American groups on various tests indicates a cognitive ability pattern characterized by higher spatial and visual skills and lower verbal skills.

Ethnographic Research

A similar conclusion about the strength of visual as opposed to verbal skills appears to follow from ethnographic research on the characteristic mode of learning among Native American children outside the context of formal schooling. Many researchers have pointed out that different Native American groups share an orientation toward "observational learning" (Cazden & John, 1969; John-Steiner, 1975; Moore, 1982; Kaulback, 1984). Reviewing this literature, Kaulback (1984, p. 34) concludes:

> Although far from conclusive, there is a growing body of research to suggest that distinctively different child-rearing practices--one stressing observational learning and another

emphasizing learning through verbalization--has fostered the development of very different styles of learning among Native and white children. Whereas many white children, by virtue of their upbringing and their linguistic exposure, are oriented towards using language as a vehicle for learning, Native children have developed a learning style characterized by observation and imitation. Such differences in learning styles have far-reaching consequences in the formal education of Native students, particularly in view of the fact that the formal educative process almost always favors those who are highly verbal.

In sum, both psychological research on Native Americans' cognitive ability patterns and ethnographic research on Native Americans' observational learning style lead to the hypothesis that Native American children would do better in school if instruction were not so verbally saturated and drew more upon visual and spatial abilities. This conclusion seems so straightforward, so logical, and so compelling that it is difficult to believe it is not valid.

Research on Instruction Adapted to "Learning Styles"

While research on the cognitive ability patterns and learning styles of Native American groups has been well-summarized, we found no reviews of the literature on the effects of instruction adapted to these ability patterns and learning styles. To examine this

literature, we conducted a computerized search of three databases: Educational Research Information Center (ERIC), Psychological Abstracts, and Dissertation Abstracts. We used as descriptor terms the various constructs used to denote this area--learning style, cognitive style, learning modalities, learning strategies, and aptitude-treatment interaction. We followed up all references to studies suggesting the educational effectiveness of instruction adapted to Native American learning styles in articles reviewing Native Americans' cognitive ability patterns, such as unpublished doctoral dissertations and qualifying papers.

These efforts yielded only three studies testing empirically the proposition that instruction adapted to Native Americans' learning styles would increase achievement. Of these three studies, two studies do not show that Native American students learn more with visually-based instruction. Another study found support for the proposition in one site but not in another, and the visually-based instruction was even more effective for Caucasian children, thus calling into question the notion that the instruction was effective because it was "culturally adapted."

The absence of published studies supporting the effectiveness of instruction adapted to Native Americans' learning styles does not, of course, constitute evidence that such instruction would not be

effective. Nonetheless, it is curious that so little research has been published in this area since this issue has been discussed for at least twenty years. Possibly researchers (like the first author) have done studies of this type, found the results disappointing, and not bothered to publish them.

Due to the difficulty of obtaining the unpublished material, we review the three available studies in detail. Before discussing them it is useful to make clear what would constitute an adequate test of the hypothesis that instruction adapted to Native Americans' visual learning style will increase learning. Such a study must contrast at least two instructional methods--one culturally adapted and the other not so adapted. Such a study should include two representative samples--a Native American group and a Caucasian group. To provide evidence for the efficacy of culturally adapted instruction, the study needs to do more than show that Native Americans learn more under the instructional strategy adapted to their characteristic learning style. The study needs to show as well that this culturally adapted strategy has greater benefits for the Native American group. Otherwise, the presumably "culturally adapted" instruction may just be better instruction--more effective for any cultural group regardless of its distinctive ability patterns.

Study 1: Donald Erickson. Verbal and diagram-supplemented instructional strategies and achievement for Eskimo students. Qualifying Paper Submitted to Harvard Graduate School of Education, 1972.

This study attempted to demonstrate that a visual instructional approach would increase school achievement among Eskimo children. The basic design was a pretest-posttest randomized group comparison of Eskimo and Caucasian students taught a science lesson by visually-based versus verbal-only instructional methods.

Two methods of instruction were developed to teach a lesson on the food chain and superordinate and subordinate classification relationships. During the visually-based lesson, the instructor discussed familiar animals and showed how they could be classified as herbivores, carnivores, and omnivores. By means of an overhead projector, the instructor used circles to represent each animal group and placed the names of the exemplary animals within the circles. Thus, in this lesson, students had a visual representation of the logical class relationships. Next the instructor visually showed the relationships between these classes of animals and plants, sun, soil, and water in a food chain. The instructor used a diagram of the food chain to show students visually (by wiping out links on the chain) what happened to animals higher up in a food chain when lower links were destroyed. Following the lesson, students completed a written

test where the questions were similar in form to the questions the instructor used in the lesson (e.g. "If all the plants died, would herbivores be able to live?"). An important limitation of this test is that it did not contain questions using visual materials. The verbal-only lesson was identical to the visually-based lesson except that no diagrams or other visuals were used.

The sample consisted of 60 fourth- through eighth-grade Eskimo students in two communities--a highly isolated Eskimo village which relied economically on subsistence hunting and fishing and a neighboring Eskimo village with somewhat more western contact but still highly traditional in its economy, language, and social structure. The comparison group consisted of 89 fourth-grade Caucasian students from a nearby Alaskan town.

To determine if the diagram-supplemented instruction drew upon visual abilities and reduced the association between verbal abilities and achievement, the sampled students completed a series of tests measuring vocabulary, memory for designs and four measures of spatial and visual memory abilities.

Erickson found that the visually-based lesson led to higher achievement ($p<.035$) in the Eskimo sample, but he found even greater benefits for visually-based instruction in the Caucasian group. In addition, the difference in means for the visually-based Eskimo group and the verbal-only Eskimo group was educationally trivial.

Analysis of the relationship between various cognitive ability measures and learning in the visually-based and verbal-only lessons did not support the proposition that the visually-based method was drawing upon visual or spatial abilities. Scores on the visually-based lesson were not significantly more strongly associated with perceptual test scores, although a very weak trend occurred in this direction.

In sum, Erickson's study found that visually-based instruction increased achievement for both Eskimo and Caucasian students. The visually-based instruction, however, did not make more of a difference for the Eskimo students than for the Caucasian students.

Study 2: Brian Thomas Shears. Aptitude, content and method of teaching word recognition with young American Indian children. Doctoral dissertation, University of Minnesota, 1970.

This study compared visual versus auditory methods of teaching basal reading words to American Indian kindergarten children living on a Minnesota reservation. The stratified sample of 12 subjects were placed in high, average, or low readiness groups on the basis of their scores on the Metropolitan Readiness tests.

Each student was taught four sets of words with two of the lists drawn from the Sally, Dick and Jane reader and the other two sets drawn from everyday reservation experiences. In the auditory

teaching method, the instructor used a phonics method to teach words listed on cards. In the visual method, pictures accompanied the words. In addition, the instructor drew attention to the form of the word by asking children to identify the longest and shortest words and drawing on the board the graphic shape the word made.

The results indicated no significant difference between the visual versus auditory methods of teaching words to the American Indian kindergarten sample as a whole. Children at a low reading readiness level, however, did learn more than children at a a high reading readiness level when the words were taught through the visual method. This result suggests that the critical feature in the effectiveness of the visual method was low verbal aptitude, not high visual abilities.

Study 3: Rosemarie McCartin and William J. Schill. Three modes of instruction. Journal of American Indian Education, 1977, 14-20.

This study compared the effectiveness of three instructional methods in teaching a lesson on the nature of cities: (1) written textual materials with pictures appearing in the text, (2) oral materials with small pictures, and (3) oral materials with large pictures presented on an overhead projector. The sample consisted of 96 Native American third through eighth graders, randomly assigned to treatments. No significant differences were found. While the study

was designed to test the hypothesis that "students who receive instruction using the visual communications method will do significantly better than the students who receive instruction in the same concepts orally, or through reading a text" (McCartin & Schill, 1977, p. 18), some pictures were shown in each instructional method. Nonetheless, greater emphasis on visual materials did not lead to greater learning for this group of Native American students.

Other Research on Learning Styles

The few studies of teaching methods adapted to Native American students' visual learning styles provide virtually no support for the hypothesis that this type of culturally adapted instruction will increase achievement.

While a comprehensive review of the general literature on learning styles is beyond the scope of this paper, it is worth noting that this field of research has not fared well over the last twenty years. This research area originated in Cronbach's (1967) conception of "aptitude-treatment interaction" (ATI), in which he suggests that learners with different styles of information processing would learn more effectively if the instructional method was adapted to their distinctive information processing style.

Reviewing the area of adapting instruction to individual differences among learners in the most recent Handbook of Research on

Teaching, Corno and Snow (1986) argue that the notion of matching instruction to particular "aptitudes" is an oversimplification that has led to little educational progress. The field has moved away from studying "aptitude-treatment interactions" based on narrow definitions of aptitudes. Since the general field has not produced educationally useful findings, we doubt that further studies of Native American aptitude-treatment interactions will yield such findings.

Continued Popularity of the "Learning Style" Construct

Despite the lack of research foundation, the notion that instruction should be adapted to Native Americans' distinctive visual learning style enjoys continued popularity. Reviews of the literature followed by instructional suggestions appear with regularity. We suggest three reasons for this situation.

First, educators and researchers use the term "learning style" to avoid "deficit" language in discussing Native American students' educational problems. The term "learning style" suggests that differences in school achievement are not due to "deficiencies" but merely to variations in the way students learn.

Second, proposal writers tell us that the "learning style" concept gives them a way to argue that special funding for academic instruction for Native Americans is justified. Major funding sources

in Native American education, such as the Indian Education Act or Johnson O'Malley program, require proposals showing how instruction will be explicitly targeted to Native American groups.

Third, teachers use the term "learning style" as an umbrella concept referring to a wide variety of adaptations they make in teaching certain Native American groups--adaptations in vocabulary, pacing of the classroom, frame-of-reference, displays of emotion, use of hands-on instruction, etc. Each of these instructional adaptations is justifiable in terms of the cultural context. These types of adaptations, however, have little, if any, relationship to "learning style" as conceptualized in the psychological literature on cognitive ability patterns.

Conclusion

Despite more than twenty years' discussion of the importance of adapting instruction to Native American students' visual learning style, research has not succeeded in demonstrating educational benefits. Certainly future research may do so, but the lack of progress in the broader area of aptitude-treatment interactions gives us no basis for optimism. We regretfully conclude that researchers interested in improving Native American education might direct limited energy and funds elsewhere.

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